HE2001 MICROECONOMICS PROJECT

A social planner's dilemma in choosing different election voting systems to get the most desirable social outcome.

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Group 26
Date Submitted: 18 April 2021

This project evaluates inherent limitations in various electoral systems that may be susceptible to manipulation, resulting in undesirable social outcomes. Plurality voting is commonly used. Depending on the country using it there are many variations("First Past the Post," n.d.). For the scope of this project, First Past The Post (FPTP) will be explored. However, in FPTP two candidates can be neck to neck in the election race and the outcome may be inconclusive. Therefore, another type of plurality voting system proposed is the two-round system. This system allows for a second round of voting if the first-round results in two candidates having a close percentage of votes. This ensures that the person who wins the election is supported by the majority. However, this system is vulnerable to manipulation of votes in the first round such that a less preferred candidate can advance to the second round and win the election. A major issue surrounding any type of plurality voting is the 'disproportional legislature' (Peelish, 2016). A 'disproportional legislature' occurs when the proportion of votes gained by the candidate is not representative of the number of seats the candidate wins. Hence, resulting in a disproportional legislature. To minimize such discrepancies between the percentage of votes and the number of seats the candidate gets in a plurality voting system, a proportional voting system is proposed. Yet, the proportional voting system can lead to a gridlock in the government (Ace Projects, n.d.) and this may not maximize social welfare.

A social welfare function is defined as the sum of all individual welfare functions(Hal Varian, 2014). Ideally, a social decision mechanism should have the following three properties(Hal Varian, 2014):

(1: Complete, transitive, reflexive) If individual preferences are completive, transitive, and reflexive, the social outcome should also be complete, transitive, and reflexive. In the context of the election, there is no rank voting, and the public is only allowed to vote for one candidate at any given time. It may be better to analyze the social outcome and not the individual preferences. For example, the society can vote such that A > B, B> C, A>C where A is preferred to B, B is preferred to C and A is preferred to C. This ensures that society has voted such that the preferences are complete, transitive, and reflexive. Yet, in the case of A>B, B>C, C>A, is not transitive. Hence, it becomes exceedingly difficult to decide which is the preferred social outcome. This condition is dropped in FPTP and proportional voting system.
(2: Pareto Efficient) If everyone prefers candidate A to candidate B, the social preference should rank candidate A over candidate B. In the context of elections, if the majority prefer candidate A to candidate B, the social preference should rank candidate A over candidate B.
(3: Independence from Irrelevant Alternatives) The preferences between candidate A and candidate B should depend only on how people rank candidate A versus candidate B and not how they rank other candidates. In the case of the two-round system, the 'ranks' of winners can affect who goes to the second round and who is declared the winner.

However, according to Arrow's impossibility theorem, all three cannot occur simultaneously in reality and if it does, the society is experiencing a dictatorship(Hal Varian, 2014). Condition 2 will not be dropped under any circumstances since the outcome is pareto efficient, which maximizes social welfare.

If the system can be manipulated such that the social outcome is favorable to the minority group of individuals but unfavorable to the majority, then the electoral system does not maximize social welfare. For the scope of this paper, it is assumed that there are no fraudulent acts taking place during the voting. Individual preferences are made solely by the individual by analyzing their preferences and deciding what is the best for them. These individuals are not paid or forced against their will to make decisions.

In the plurality voting system, the public votes for the candidates, and the candidate with the highest number of votes or percentage of votes win. The first electoral system in question is the **First Part the Post (FPTP)** system. Many countries including the United States and the United Kingdom use this electoral system albeit with different variations(Ace Projects, n.d.). For this paper, the FPTP is defined as a system where the country is divided into different geographical sections each having two or more candidates fighting for votes from the public. The candidate with the highest vote in that geographical section will win that section. In the overall election, the candidate which won the most seats would be elected to the parliament.

One benefit this voting system provides stability and accountability in the government as it produces a one-party majority government. These governments tend to be more durable as compared to a minority government(Andre Blais, 2008). This facilitates the passing of bills in parliament.

The downside to this system is that ruling parties can manipulate the geographical boundaries and the seat allocation for the next election. This creates a 'disproportional legislature' where absolute votes are not proportional to the number of seats gained. Take for example the 2016 United States Election between Donald Trump and Hillary Clinton. Clinton won 65.84 million votes and Trump won 62.98 million votes. Clinton had won in terms of absolute votes(Conversation, 2019; Sides, Tesler, & Vavreck, 2017). However, in 2016 Trump had won the election by gaining more seats. This was due to the number of seats allocated to the different geographical locations being disproportional.

Expanding this to an arbitrary example in a country X with 3 geographical locations, it can be seen how manipulation can occur. In this country X, there are a total of 100 seats, 2 candidates, and the first person to reach 51 seats wins the election.

Table 1- Plausible disproportional legislature in FPTP voting system

	Geographical location 1	Geographical location 2	Geographical location 3
Number of people	1.3 Million	2.7 Million	2.4 Million
% Votes Won by the candidate	56 (won by A)	76 (won by B)	51 (won by A)
Number of seats won	40	36	24
Candidate A		Candidate B	
Popular vote	$1.3 \times 0.56 + 2.4 \times 51 + 2.7 \times 0.24 = 2.6$	Popular vote	$2.6 \times 0.76 + 1.3 \times 0.44 + 2.4 \times 0.49 = 3.724$
Seats Won	64	Seats Won	36

From the above example, even though a candidate may be supported by the majority of the public, they may not win an election. Therefore, resulting in a pareto inefficient outcome.

Suppose there were 4 candidates present with 15 geographical locations and a total of 200 electoral seats (101 to win). The seats won by candidates A, B, C and D are 36, 36, 18, 10. Candidates A and B end up with the same number of votes. In this case, the social outcome is not transitive since society is indifferent between A and B. Hence, society is worse off. As such a Two-Round System (TRS) is proposed to solve this issue.

A **Two-Round System** is also a plurality voting system where there are two rounds of elections. Each of these election rounds resembles FPTP. Hence, in the above case where A and B have the same number of votes, a TRS would help to resolve this by conducting a second round between candidate A and B (Ace Projects, n.d.). One country that is most associated with TRS is France (Conitzer & Sandholm, 2006). Usually, in such a system, there are always more than 2 candidates.

Taking a Country Y but now instead of having to vote for candidates representing their geographical location, the public votes for three Candidates A, B, and C (no geographical boundaries), and the candidates need to obtain 40% of the vote in the first round without a need for the second round. As illustrated in Table 2, even if an individual's most preferred candidate does not advance to the second round, the public would still follow their internal preference. Assume the internal preferences of voters are as follows (eliminate the candidate who loses in the first round from the voter's preference in the second round):

10 voters: A > B > C **260 voters: A > C > B** **300 voters: B > C >A**
340 voters: C > A > B **50 voters: C > B > A** **40 voters: B > A >C**

When A is removed:
10 voters: B > C **260 voters: C > B** **300 voters: B > C**
330 voters: C > B **50 voters: C > B** **40 voters: B > C**

Table 2 - Two Round System: number of votes

	Candidate A	Candidate B	Candidate C
1st Round (No. Of people)	270 (27%)	340 (34%)	390 (39%)
2nd Round (No. Of people)		350 (35%)	650 (65%)

In Table 2, voters follow their internal preferences. Hence, utility is maximized as the voting is fair. However, TRS can be subjected to manipulation to achieve a socially undesirable outcome. Voters for Candidate A know that A is not able to make it into the second round. Suppose that voters no longer follow their internal preferences and those that prefer A significantly dislike Candidate C. In this case, voters for Candidate A prefer B to C and they vote for B. Initially, C will win in the second round (Table 2), but with manipulation, voting would end in 1 round with B winning (Table 3).

Table 3 - Two Round System with manipulation

	Candidate A	Candidate B	Candidate C
1st Round (No. Of People)	0	610 (61%)	390 (39%)

Furthermore, TRS may cause a more reduced turnout, since voters are unwilling to vote in the second round when their most preferred candidate loses. This leads to their welfare being 0 automatically. Also, holding a second round of voting is costly. In this case, social welfare is not maximized. Although TRS can resolve conflict if two candidates have similar votes, it is vulnerable to manipulation.

To prevent manipulation and a 'disproportional legislature' caused by FPTP and TRS, a **proportional voting system** is proposed. It is a system where the number of seats gained is proportional to the percentage of votes gained(Ace Projects, n.d.). This will result in a multimember constituency. Some countries that have adopted this are those in western Europe, Israel, Brazil, and South Africa.

One advantage of this is that a winner does not take all, minimizing the chances of under-representation of a certain party. Hence, this system would allow for less wasted and more effective votes (Amy, 2000). In contrast, in FPTP and TRS, if a party gets 30% of the votes and does not win, the votes will be wasted. Psychologically, this system would also encourage voters to vote truthfully. In FPTP and TRS, voters may choose to vote for the more established parties instead of singular candidates who are unlikely to win, which includes women and different ethnic or racial groups. Hence rather than wasting their votes, individuals would rather vote for the party likely to win. However, in this system, voters are encouraged to vote for less established candidates since they are more likely to win. By allowing everyone to state their preference and gain individual utility, social welfare is improved.

However, a common critique of this system is that it will create an unstable government. Due to the presence of multiple candidates with different perspectives, it is prone to arguments when deciding on policies. This would result in gridlock in the government as it will be harder to reach a consensus on which policy would be the best. Such as in the case of Italy (Talyor,A, 2019), whereby it kept falling apart and reforming, leading to an unstable government that is inefficient. This would then lead to stagnation and longer duration for bills to be passed. In times of emergencies and social unrest, the delay in passing legislation would put the people of the country in dire straits. During COVID-19, Italy was unable to pass down crisis management policies in time due to its unstable government (Horowitz,J, 2021). In addition, it also works against the public who would need such policies to improve their standards of living and welfare in the country. Hence, in cases where there are disagreements, it may decrease the societal welfare.

In conclusion, the plurality voting system is still better than a proportional voting system due to the latter causing potential gridlock in the government. Gridlock is not desirable under any circumstances even if the election results in something favorable to the public. With respect to the FPTP and the TRS, it entirely depends on the country itself. This is done by analyzing and understanding how FPTP and TRS works and how factors such as how many candidates there are present, the distribution of seats among the geographical locations, the society itself etcetera can affect the voting system. Both FPTP and TRS have their own benefits and limitations. It is up to the policymakers within the country to understand the needs of its country and maximize the election systems' benefits while minimizing its limitations.

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